certain periods. It thrives wonderfully in winter gardens in southern Florida.

Patience Dock is a relative of the sorrel, possessing a similar pleasant acid flavor and very productive throughout the summer. There is also an African dock, *Rumex abyssinicus,* lately introduced by the U. S. Department of Agriculture, which is adapted to the warmer parts of the country. Its leaves are strongly acid and the stems and petioles cook up into a rhubarb substitute of merit, because still palatable after thrice cooking, a process that completely ruins rhubarb.

French Sorrel should be in every diabetic garden for two reasons, its distinctive flavor and its early season. The plant is perennial, of easy culture, commencing growth before spring frosts are over and continuing to yield pickings through the season, except in midsummer. The broad-leaved, cultivated sorrel has the same oxalic acid flavor we know in the common wild sorrel. We like it occasionally by itself, but more for mixing with spinach or chard. The tender leaves are also valuable in mixed salads. I have never seen sorrel on sale in the market.

All these acid and bitter vegetables possess special merit for salt-free diets, since they are greatly relished by patients from whom common salt is withheld in the treatment of nephritis, arteriosclerosis, etc.

Vegetable Marrow is a type of squash deserving more general culture because it has more substance and a finer flavor than our common summer squash. The vining varieties are too vigorous growers to be let into the small garden. They delight in covering rubbish-heaps or manure-piles, but there are bush varieties also, adapted to more limited space. Try the following of many ways of cooking:

1. Fried Marrow: Gather the fruit while young and tender, cut into slices and fry in the same manner as eggplant.

2. Vegetable Marrow au Gratin: Peel well-grown marrows, remove the seeds and parboil in slightly salted water; cut into pieces and place in layers in a buttered baking dish, sprinkling each layer with salt and pepper and finely minced parsley and a little butter; cover with crumbled bran biscuits and grated cheese and bake thirty minutes. Serve hot. .

Witloof (sometimes in the market as endive or French endive) is particularly to be recommended because it furnishes a superb salad during the winter months and can be forced in the cellar by anyone having a couple of square feet of space near the furnace.

Witloof is a kind of chicory much grown in Belgium. It is planted and cultivated like parsnips and produces long, white roots, which are taken up, packed in boxes and later brought into a warm cellar and watered. The heads form in three weeks or so. When these are cut a crop of slender sprouts follow. It is relatively easy with six to eight boxes of witloof to maintain a succession of fresh salad from Christmas until May.

Witloof roots can be purchased and forced by those who have no gardens. To make sure of them it is well to arrange in advance with a gardener to have the crop grown.

Vegetables in the Ornamental Garden. Several of the vegetables suited for diabetic diets are beautiful plants, worthy of a place in the ornamental border, and as they will grow in partial shade if well watered they may be planted in beds along building lines and walls or fences or bordering walks and lawns when no space is available for a kitchen garden. All forms of chard are handsome plants, particularly the red Chilean and yellow Chilean, which have bright red or yellow leaf-stalks. If set a foot apart they will grow two feet or more high.

Chenopodium amaranticolor is a lambs'-quarter from Algeria, with brilliant maroon buds and young leaves, which are eaten as spinach. The special merit of this plant is that it withstands thrice cooking particularly well. In my garden it forms a hedgerow six feet high.

Finocchio is a pretty plant with delicate feathery leaves. Tall curled kale is also handsome. The red orach has red bronze foliage as effective as many ornamental bedding plants.

DEFECTS OF MEMBRANOUS BONES, EXOPHTHALMOS AND POLYURIA IN CHILDHOOD: IS IT DYSPITUITARISM?[1]

By Alfred Hand, M.D.,
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In the *Transactions of the Pathological Society of Philadelphia*, vol. xvi, 1891–93, under the heading "General Tuberculosis," and also in the *Archives of Pediatrics*, vol. x, 1893, with the caption "Polyuria and Tuberculosis," I made the following report, exhibiting the specimens to the society:

On December 1, 1892, a boy, aged three years, was admitted to the Children's Hospital with a history of great thirst and polyuria which had begun suddenly eight weeks before. He had had enterocolitis at five months of age and croup and measles together at two years. The family history was negative, the parents, three brothers and two sisters being alive and well. One younger sister died of enterocolitis. There had been no miscarriage.

The examination showed the boy to be undersized and puny, with light hair, brown eyes and a bronzed, dry skin. The eyes were in a condition of exophthalmos, giving him a frog-like appearance, and there was a corneal opacity on each eye, with anterior synechiæ in the right. The thyroid was not enlarged. His chest was very small and narrow and the rachitic rosary could be felt; the lungs and heart were normal. His belly was distended and tympanitic, obscuring for several days the great enlargement of the liver and spleen, which at first were thought to be normal in size; there was an umbilical hernia and the skin of the abdomen was covered with petechiæ and an eruption something like scabies. The feet were edematous.

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[1] Read before the American Pediatric Society, May 31, 1920.

The urine had the following characteristics: Acid; cloudy; specific gravity, 1.000; quantity in twenty-four hours, 114 ounces; no sugar; albumin distinct.

The boy seemed to suffer so much from thirst that water and milk were not withheld and he was given a drink whenever he asked for it. He was at once put upon 2 minims of the fluidextract of ergot three times daily. This had no effect whatever; at the end of a week the daily amount of food ingested was 180 ounces, of which 150 ounces passed through the kidneys without taking up either albumin or sugar, the specific gravity not rising above 1.000, but the color being like that of a saturated solution of picric acid. During this week the temperature had been rather irregular, but there was no decided fever until the seventh day, when the thermometer registered 102.2°. The ergot was now replaced by laudanum, 2 drops every six hours. Before this the thirst had not allowed more than a few minutes' sleep at a time, but the boy now began to take longer naps, and the amount of fluid taken and excreted fell to 100 ounces. During the next week the urine contained albumin once, but at the end of that time was free from it, had changed to pale yellow in color and had a specific gravity of 1.010. After this the total amount could not be collected, so an idea of the amount voided could only be gained by measuring the quantity of water and milk drunk, which decreased to about 80 ounces. December 20 the urine had its highest specific gravity, 1.012, but the next day it fell to 1.004. On the 22d the temperature rose from 99° in the morning to 105° at 4 P.M. It was normal on the 23d and at 6 A.M. of the 24th, but at noon it was 103°. The opium was then stopped and 1 grain of quinin given three times a day, with a very beneficial result. The temperature for six weeks did not vary 1° from normal, the liver and spleen decreased in size, the petechiæ on the abdomen gradually faded, the boy was able to get up and walk and he ate and drank no more than a child of three years should.

February 12, at 6 P.M., the temperature was 99°; four hours later it had risen 5°. After a few days a bronchopneumonia was discovered and a further diagnosis was made, from a general view of the case, of tuberculosis. For a week the temperature was very irregular and there was a marked systemic depression. On the 19th the purpuric spots increased in number and an elevated, dull-red, macular rash appeared all over the body and extremities. At 8.30 P.M. he sat up and asked for a drink. Two hours later the body was cold and rigor mortis had set in.

The autopsy was made fifteen hours after death. The rash had faded from the left side but still persisted on the right. As the scalp was stripped off a yellow spot, about the size of a five-cent piece, was noticed near the right parietal eminence. When the skull-cap was removed this spot was seen on the inner side as well and the entire thickness of the bone was soft and movable. Other smaller areas not extending through the vault were seen on the outer surface. In the absence of any history of syphilis these were thought to be tuberculous. The brain was normal to macroscopic examination. The lymphatic glands in the omentum, mesentery, mediastina and, in fact, all through the body, were greatly enlarged. There were a bronchopneumonia of both lungs, a warty endocarditis of the mitral valves and a caseous pleuritic adhesion at the base of the right lung. The liver and spleen were enlarged and firm and the former had minute, gray nodules in its substance. The pancreas was apparently normal and there were no ulcers or scars in the intestines. The kidneys seemed slightly enlarged; the left contained three cysts and in the pelvis of each was a yellow, hard, tubercular mass, almost filling it. Microscopic sections prepared by Dr. W. S. Carter showed nodular masses of small round-celled infiltration in the liver, spleen, kidneys (pelvis), a bronchopneumonia in the lungs and a degeneration of the epithelium of the uriniferous tubules.

Subsequent experience at the autopsy table, with a large percentage of the cases showing tuberculosis, but without duplicating these features, made me begin to doubt whether the tuberculosis in this case had any causal relation to the triad of symptoms described, and this doubt was further strengthened by seeing in 1905 a patient presented to the Medical Society of the State of Pennsylvania by Dr. Thomas W. Kay, and reported by him[2] under the title "Acquired Hydrocephalus with Atrophic Bone Changes, Exophthalmos and Polyuria (with Presentation of the Patient)." Dr. Kay's paper is so interesting that I quote it in full:

"R. S., male, aged seven years, and the only child of healthy parents. Up to four years of age he was healthy and well-grown, as shown by photograph. He was attacked by scarlatina at that age, which was followed by a discharge from the right ear that still persists. Four months after scarlatina he had vertigo and cried occasionally with pain in the head. About this time enlargement of the superior cervical and submaxillary glands took place, which was most marked on the right side. These glands are still enlarged but give no discomfort.

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[2] Penna. Med. Jour., 1905–6, vol. ix.

"Five to six months after the scarlatina the gums began to separate from the teeth, and this was followed by a gradual loss of most of the teeth, beginning with the molars. About the same time the mother noticed a soft spot on the head, which side she does not remember, where there seemed to be no bone.

"Eighteen months ago exophthalmos began to make its appearance and has been getting steadily worse. Now it is so bad that the eyes have to be protected by wearing a handkerchief over them, as they are too prominent for the use of glasses.

"Fourteen months ago polyuria appeared and he would void his urine in small quantities, 200 or more times in twenty-four hours. Now he micturates several times an hour, and as much as 27 ounces at a time is passed. Its reaction is neutral and the specific gravity is 1.000 to 1.001.

"Seven months ago he weighed 32 pounds and he passed 27 quarts of urine daily (54 pounds). Now he weighs 36 pounds and he passes 23 quarts daily (46 pounds).

"The bones of the body, with the exception of the lower jaw bones and of the cranium, are comparatively normal. The lower jaw has lost its bone-salts, and the resultant cartilaginous mass, containing one incisor has been so deformed by the depressor muscles that the chin has disappeared.

"The circumference of the cranium is 53 cm., the right side being slightly larger than the left. The squamous portion of the right temporal bone gives readily to pressure with the finger. The right parietal bone has in large part been absorbed, leaving an irregular 6 x 7 cm. oval opening. The left parietal bone has been nearly entirely absorbed, leaving an irregular 9 cm. x 11 cm. oval opening. The frontal bone has suffered on the left side, resulting in an irregular 4 cm. x 5 cm. triangular opening. The bone at the sites of the fontanelles and sutures is not affected. When I first saw this patient some seven months ago the openings in the bones were not as large by 1 cm. in diameter as now. The patient is irritable but fairly bright, and the organs of special sense and the rest of the body are in as good condition as could be expected. Whether awake or asleep his breathing is somewhat stertorous. Of course, with polyuria there is a corresponding polydipsia. The causative lesion in this case is situated, most likely, in or near the floor of the fourth ventricle."

Bearing these two cases in mind it was with interest that I saw in the prospectus of the *Osler Memorial Volume* the title of an article by Henry A. Christian, "Defects of Membranous Bones, Exophthalmos and Polyuria, an unusual syndrome of Dyspituitarism," and I hoped that the solution of these two cases had been reached. Dr. Christian's report is very thorough, giving the results of a careful study of his patient during a stay of six months in the hospital. The patient is a girl who was well up to three years of age, when the teeth began to decay and the gums became sore; exophthalmos began at three and a half years, with increasing thirst and polyuria. When studied at the age of five years the roentgen-ray plate of the skull showed extensive defects in the bones and similar but slight changes were also found in the ilium and ischium. Two similar cases were found by Dr. Christian in a search of the literature, reported by Schueller in the *Fortschritte auf der Gebiete der Roentgenstrahlen*, 1915–16, xxiii, 12, under the title "Ueber eigenartige Schaeldefekte in Jugendalter," one, a boy, aged sixteen years, with dystrophia adiposogenitalis, showing exophthalmos and defects in the bones of the skull but no polyuria; the other, a four-year-old girl, whose exophthalmos and bony defects began at two years of age, the thirst and polyuria also developing, at what time is not stated. Schueller's report of this case closes with the remark, "We can therefore make a presumptive diagnosis of anomaly of the skeleton as the result of disease of the hypophysis." Dr. Christian treated his patient with pituitary extract, and when this was given under the skin or into a vein a great lessening was seen in the amount of fluid ingested and excreted, but administration by mouth or rectum had no effect. He therefore concludes

Skiagraph of head showing areas of absorption in calvarium; sella turcica sharply defined.

that the symptom-complex is probably due to disturbed pituitary function.

Two weeks after I had received the prospectus of the *Osler Memorial Volume,* and while waiting eagerly for the publication, there was brought into my office by Dr. L. F. Luburg, a boy, four years old, from whom there had been removed at two years of age a tumor-like swelling in the left parietal region, absence of the bone beneath it down to the dura being noted; the pathological report on the tissue removed was "No gumma; no sarcoma; slight degree of inflammation; mainly myxomatous change." Since then other swellings have appeared and exophthalmos, greater on the left, has taken place, but as yet no polyuria. The boy was very irritable and objected to being examined, so it was possible to make only a brief examination, which was negative, except for enlargement of the cervical glands. The boy was then taken to the Methodist Hospital, where the blood and urine were examined without showing anything unusual, and a skiagraph of the skull taken which is here presented through the courtesy of Drs. Luburg and Percival. The boy was so restless and irritable that it was a difficult matter to get satisfactory plates, but they all show the large areas in the calvarium without bone, and overlying these the mounding up of the scalp; one of the plates (see illustration) gives a clear-cut view of the base and shows the sella turcica to be uninvolved in the bone-change, differing in this point from the illustration in Dr. Christian's report in which the sella turcica is decidedly affected. The patient was then taken to his home in the interior of Pennsylvania, where he is still (May, 1920) living.

To explain the origin of these cases the theory of dyspituitarism is a very captivating one and receives partial confirmation from the action of pituitrin in Dr. Christian's case. But after a review of the works of Sajous, Gley and Schaeffer on the physiology and known pathology of the endocrine organs, and also after an analysis of these six cases, it seems to me there are several objections to that theory. But let me hasten to state that I agree with Dr. Christian that the polyuria depends on disturbed hypophysis function, as will be explained later. And I also agree with him that the condition does not seem to depend on syphilis. The objections to the theory of dyspituitarism are:

1. Two of the cases have not shown any polyuria.
2. In two of those having polyuria, and probably in all four, the exophthalmos and the bone-changes came first.
3. Injection of pituitrin, although diminishing the polyuria, had no effect on the bone-changes.
4. The exophthalmos is probably not of toxic or endocrine origin, but as Schueller suggests is mechanical, due to involvement of the

orbital plate of the frontal bone, as shown by the four who have been studied by the roentgen rays.

5. The changes in the bones, as suggested by Dr. Percival, are not such as would most likely be produced by a chemical substance, which ought to affect the bones in their entirety; but these changes start in a number of different foci, as though some solid bodies were carried to the bones in the blood supply, and lodging in the medulla or periosteum set up their action there. In confirmation of this is the observation in my first case that in some areas only one table of the bone (the outer) was affected.

6. As mentioned above the polyuria probably depends on disturbed function of the hypophysis, this disturbance being due to pressure from changes in the bone in the immediate neighborhood of the gland. Thus in the two patients who have not had polyuria (Schueller's first and my second case) the roentgen-rays showed the sella turcica to be unaffected, while in the other two who had been skiagraphed (Schueller's second and Christian's, both having polyuria) decided changes were shown in the sella.

Other Theories. Dr. Percival made the remark while examining the plates that the appearance of them is typical of osteosarcoma, but that this can be excluded by the duration of life in most of the patients. This suggests, as one possible explanation, that the primary process may be neoplastic, benign and myxomatous in character, affecting for some unknown reason the membranous bones and producing exophthalmos and polyuria secondarily by pressure.

Another thought, that of a chronic infectious process, is raised by the presence in two of the cases of prolonged suppuration (discharging ear) and in three of enlargement of the lymphatic glands. But these enlarged glands may be only part of a general lymphatic enlargement with an enlarged thymus, which brings us back to the endocrine theory again, but this time referring it to the thymus, about which so little is known. It is known to have some influence on the skeleton, and some disturbance of it is supposed to be associated with achondroplasia, but strangely in that condition the membranous bones are found to be uninvolved, so this theory seems unlikely.

With the possibility of this being an infectious process, and since at least two of the cases seemed to start with decay of the teeth and inflammation of the gums, the thought occurs that the infective agent may gain entrance through these structures and may be animal (ameboid) rather than vegetable in nature. This theory also offers an explanation for the apparent benefit in my first case following the use of quinin.

Further observations are needed before this curious and interesting group of symptoms can be satisfactorily explained.